

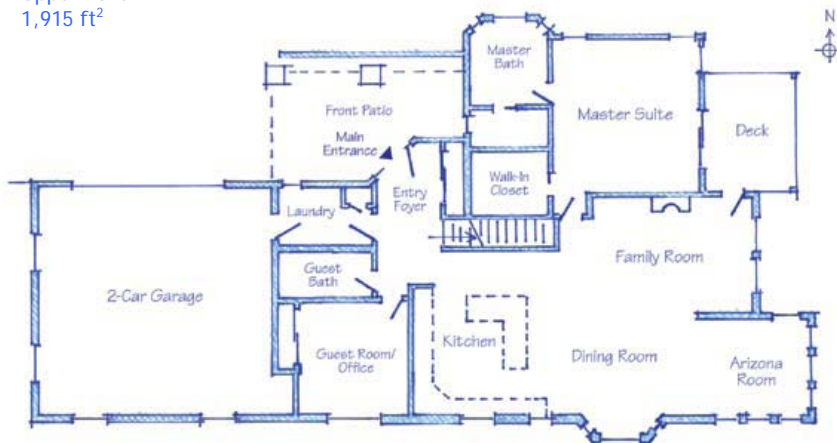


Longview House - An Overview of the Green-Building Performance Features in a RBT Program Award Winning House

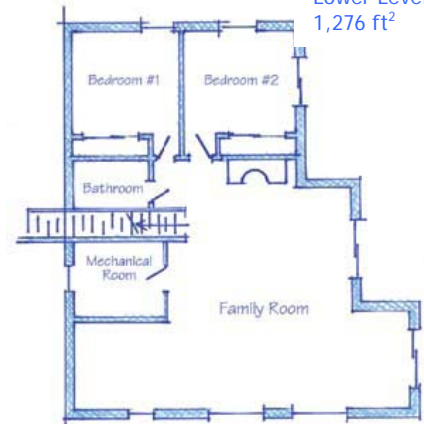
The RBT Program Mission...

Is to provide students with instruction in building science principles and their application to mainstream residential construction. Emphasis is placed on sustainable/green building strategies that result in the construction of healthy, safe, durable, comfortable, affordable, resource and energy efficient, environmentally responsive houses which incorporate appropriate materials, systems, and technologies.

Upper Level
1,915 ft²



Lower Level
1,276 ft²



Performance Criteria Guidelines

The Longview House was built to conform to these national and regional design standards:

- City of Scottsdale Green Building Guidelines
- LEED - Homes
- ALA HealthHouse
- Environments for Living
- EEBA
- NAHB Green Building Guidelines
- EnergyStar

Energy Efficiency Features

- [Slab-edge rigid insulation](#)
- Ceiling fully insulated:
 - Blown-in cellulose insulation (R-38)
 - Raised-heel trusses at roof edge
 - Wind baffles at soffit panels
 - [Rigid insulation and insulation dams at kneewalls where the cathedral ceiling meets the flat ceiling](#)
 - Recessed lighting cans insulation-contact rated
 - All ceiling penetrations sealed for a continuous air barrier
- Exterior frame walls fully insulated:
 - 1" XPS rigid insulation on all wall surfaces separating controlled environment spaces from uncontrolled
 - 2"x6" frame wall cavities have blown-in cellulose insulation (R-27)
 - Advanced framing (24" O.C. studs) allows for more insulation in wall system
 - Window headers have 2" of XPS rigid insulation
- Lower level walls and insulation:
 - Precast concrete panels have 1" integral XPS rigid insulation with additional blown in cellulose (R-26.5)
 - [Crawlspace, entirely within the conditioned building envelope, has ICF walls and concrete floor](#)
- Windows
 - Double pane Low E glass, Argon gas filled, SHGC = 0.30 to 0.35, U = 0.30 to 0.35
- Roof overhangs (including rain gutter projection) optimally sized for window heights to allow summer window shading and winter sun entry
- Extremely tight building envelope (blower door test 0.96 ACH at 50 Pascals)
 - Exterior walls have multiple continuous air infiltration barriers
 - Exterior wall penetrations all properly lapped and flashed
 - Sheetrock glued to interior wall studs for cavity isolation
 - All cutouts in the interior air barrier sealed with foam or mastic
 - [Metal ductwork sealed with mastic and leakage \(0%\) verified by testing](#)
- HVAC requirements calculated and sized appropriately
 - 3 zone system with individual zone thermostat controls
 - Balanced whole-house ventilation with HEPA filtration

- EnergyStar CFL lighting package throughout entire interior and exterior
- [2000 watt solar panels inverted for home use or net metering](#)
- Solar domestic hotwater system with electric backup element
- EnergyStar appliances include ceiling fans, dishwasher, ventilation fans

Resource Efficiency Features

Waste Reduction and Recycling

- Structural configuration of upper and lower levels is designed to be adaptable to future generations
- Roof trusses designed to be adaptable to future materials
- Advanced Framing techniques utilized
- Products that include recycled content are decking, insulated concrete forms, wall and ceiling insulation
- Cardboard and metal construction materials recycled
- [Pre-fab basement walls set on a gravel base](#)

Enhanced Durability and Reduced Maintenance

- Comprehensive moisture management strategies with subslab polyethylene sheeting, foundation drains, damp-proofing of sub-grade masonry, sill gasket, wall system composed of materials that breath, [properly flashed and lapped window and door openings](#), rain gutters
- Roof overhang calculated at 20 inches (includes gutter projection) to minimize damaging UV entry in summer
- Building materials kept dry and covered, exterior wood painted within 7 days
- Color-matched, aluminum soffit panels
- Except utility room, all plumbing is located in interior walls
- Floor drain in mechanical room

Indoor Environmental Quality

Site Elements

- Excellent ambient air quality in the Prescott Arizona area
- No pesticides broadcast on the soil prior to construction
- Building materials with organic content kept dry

Building Enclosure Elements

Multiple redundant techniques designed to keep the house dry (thereby inhibiting mold growth) and controlling the interior environment:

- [Subslab foundation damp-proofed](#)
- Soil surface graded away from the house
- Foundation drains around entire house perimeter
- Pre-fab basement walls have integral insulation to inhibit moisture condensation
- Crawlspace is within the conditioned environment and has a sealed and insulated door, and concrete floor
- Polyethylene sheeting and compacted gravel directly below the slab
- Sub-slab radon venting
- Sill gasket
- Semi-permeable wall system that allows drying from the outside and the inside
- Properly lapped and sealed door and window penetrations
- Garage is thermally and pressure isolated from the living area
- [Extremely tight building envelope. Blower door test value of 0.96 ACH at 50 Pascals](#)

Finishings and Furnishings

- All construction materials (interior paints, finishes, construction adhesives, caulks, foams) contained no or low in VOCs
- Low formaldehyde content in particleboard cabinets
- [Only hard-surfaced flooring \(wood laminate, tile, stained concrete\) in the house. No carpet.](#)
- All closet and pantry shelving is vinyl-coated wire

Mechanical Equipment

- HVAC system right-sized according to Manual J calculations and therefore optimizes humidity control
- No building cavities were used in the forced air distribution system.
- Multiple return grilles provide pressure balancing between rooms.
- During the construction process, all HVAC vents were sealed with sheet metal and mastic
- Easy access to HVAC and hotwater storage tank in the lower level mechanical room
- Balanced whole house air exchange system with MERV-10 and HEPA filtration
- All ductwork is located within the conditioned space and all leaks were mastic-sealed prior to closing in.
- Spot ventilation in every bathroom (70 cfm), kitchen (100 cfm), and garage (motion-sensor activated 70 cfm)

- Passive air inlet in laundry room provides makeup air for dryer
- Gas-burning fireplaces (2) and gas furnace are sealed combustion

Water Efficiency

- Low flow toilets, faucets, showerheads installed
- Water conserving dishwasher
- Plumbed for thermo-siphoned hot water to upstairs taps
- All hot water taps are within 30 ft of the hot water reservoir
- Gray water distribution system
- [Rainwater catchment system with 1250 gallon cistern](#)
- Landscape irrigation with drip emitters and bubblers

Lot Design and Preparation

- Landscaping includes drought-tolerant species in a setting that prevents rapid storm-water runoff
- Water-permeable pavers that compose the rear patio surface
- Long axis of house faces due south to optimize solar benefits
- Minimized disturbed area during construction and preserved as many native trees and shrubs as possible;
- Avoided use of toxic insect control materials and used other integrated pest management strategies instead

The Longview House Photo Gallery

